

1.-2. No response necessary.

3. Claims 22-27, 30 and 33-40 have been removed from consideration previously. However, Applicants respectfully request that the Restricted claims 30 and 33-40 be rejoined immediately, as all the independent claims include elements to activators and supports. Further, Applicants note request that upon indication of allowable subject matter of the currently considered claims, Applicants request rejoinder of the process claims, 22-27.

Rejections Under 35 USC § 102 and 35 USC § 103

4. & 5. *Claims 6 and 13 stand rejected under 35 USC § 102(e) as anticipated by East German Patent 280 527 A1 (Selke).*

The Examiner states that Selke discloses the invention as claimed (abstract). Applicants do not agree. A translation of Selke has been provided to the Examiner; although Applicants have made every effort to insure an accurate translation, no warranties are made. Selke is directed to hydrogenation catalysis. Furthermore, the hand drawn structure on page 2 of the translation shows the two P atoms of the bidentate ligand bonded to O atoms. By contrast, in the present claims Applicants' bridging group A corresponds to these O atoms, and "A is a bridging group containing a Group 13-15 element", and oxygen is not in these groups. Therefore, Selke does not Anticipate the presently claimed catalyst system.

Withdrawal of the Rejection as improper is respectfully requested.

6. No Response necessary.

7. *Claims 6 and 13 stand Rejected under 35 U.S.C. § 102(b) as anticipated by, or in the alternative, under 35 U.S.C. § 103(a) over U.S. 5,314,856 (Sommazzi).*

The Examiner takes the position that Sommazzi lacks the disclosure of the actual connectivity of the atoms in the metal compound.

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And "... it is chemically logical that the acid would protonate off the carbamate of the palladium starting material while chemically reducing it, and that the bidentate ligand would bond to the palladium atom, forming the L group of the present invention".

Applicants traverse the Examiner's chemical theory of Sommazzi. Sommazzi does not disclose or suggest a metal atom bond formation (such as metal-carbon) which is found in the present claimed catalyst system, and is important in polymerization of hydrocarbon based olefins.

Accordingly, no Anticipation exists, nor Obviousness. Withdrawal of the Rejections is respectfully requested.

8. *Claims 1, 6, 13 and 17-20 stand Rejected under 35 U.S.C. § 103(a) as obvious over each of Sommazzi and Selke in view of U.S. 5,866,663 (Brookhart I).*

Selke and Sommazzi are discussed above. Furthermore, Selke teaches use of a mineral acid which is contraindicated in catalysts useful in coordination polymerization. Using the Examiner's chemistry, one would be using the NCA of Brookhart I in either of Selke or Sommazzi. First Applicants find no motivation to do so, contrary to the Examiner's reasoning that use of an NCA over MAO would be driven by cost, and secondly, Applicants are unable to predict what might occur if one made the substitution suggested. If the Examiner can so predict, evidence is respectfully requested. Absent the required motivation or an evidentiary prediction of the consequences of the suggested substitution, the combinations fail to render Obvious Applicants' claims. Withdrawal of the Rejections is respectfully requested.

9. *Claims 6, 13, and 17-20 stand Rejected under 35 U.S.C. § 102(e) as Anticipated by or in the alternative, as obvious under 35 U.S.C. § 103(a) over each of Brookhart I, and U.S. 5,726,115 (Horton).*

The Examiner states in reference to Brookhart I, that Brookhart I discloses precatalyst compounds that read on the present invention can be on solid supports. Adding "...however Brookhart I does not disclose or suggest that the precatalyst compounds are "immobilized" on the supports. Nonetheless, one of ordinary skill in the art would have expected that the compounds of Brookhart I, when reacted with the

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support materials they disclose, would have become bonded to the support materials and thus immobilized".

Applicants do not agree with the logic presented. Specifically, Brookhart I discloses the use of "... a wide variety of heterogeneous inorganic materials can be made to function as non-coordinating counter ions", column 5, lines 51-53, as cited by the Examiner. When added to the other disparate elements pointed to by the Examiner in Brookhart I, the Examiner has failed to present a case of either Anticipation or Obviousness. Further, the Examiner seems to indicate that there is some inherent property in either Brookhart I or Horton that would either Anticipate or render Obvious the present claims. The law is clear in this matter, that any property stated to be inherent must necessarily flow from the disclosure of the prior art. No clear or compelling case of inherency has been made and supported by evidence.

Additionally, the Examiner's conclusion that Brookhart I would lead one to Applicants' claim elements based upon Brookhart I's Example 98 is wrong. Of note in this regard is the produce of Example 98, "... a gummy, rubbery polyethylene..." at column 110, line 52. Such a product would be a teaching away for gas phase polymerization catalyst, as in such processes "gummy" is contraindicated. Accordingly, Brookhart I neither Anticipates nor renders Obvious the present claims.

In regard to Horton, Horton is directed to catalyst compositions "... wherein M is zirconium, hafnium or titanium ..." i.e. Group IV metals and there is no disclosure or suggestion to the presently claimed "late transition metals". Applicants' claims include elements of Groups 9, 10, or 11. Accordingly, no Anticipation nor Obviousness exists.

Withdrawal of the Rejections is respectfully requested.

10. *Claims 1, 6, 13, and 17-20 stand Rejected under 35 U.S.C. § 103(a) as Obvious over each of Brookhart I and Horton.*

Applicants have discussed these documents in 9 above. Accordingly, for the same stated reasons, no Obviousness exists.

Accordingly, withdrawal of the Rejections is respectfully requested.

11. *Claims 1, 6, and 13 stand Rejected under 35 U.S.C. § 103(a) as obvious over any of U.S. 4,849,542 (Drent), EPO 0 454 231 (Brookhart II) or J. Am. Chem. Soc., Vol 117,*
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No. 23, PP. 6414-6415, (1995) (Johnson), in view of any of U.S. 5,030,606 (Klabunde), U.S. 5,328,882 (Braca), or WO 83/02907 (Masters).

Because this represents 9 separate rejections, Applicants will first address each document individually, then each separate combination.

Drent is directed to acid and/or ester synthesis, and uses mineral acids for which, as discussed above, there is no basis for such inclusion in coordination polymerization, and Drent fails to disclose or suggest the use of supports.

Brookhart II as stated by the Examiner, ~~Brookhart II~~ fails to disclose or suggest the use of supports.

Johnson, as stated by the Examiner doesn't disclose or suggest supports.

Klabunde is operating in a different catalyst area than Applicants' claims. Specifically, Klabunde's catalysts includes a bidentate ligand that has an anion group on the end, with no substituent. Viewed another way, the X of Klabunde is the E of the present claim structure, and in the present claims that would indicate that m is zero, and the present claims include m is 1 or 2. The combinations of Drent, Brookhart II or Johnson with Klabunde would not be made by the skilled person, due to the fact that the skilled person would not be motivated to combine the different catalyst of Klabunde with any of the primary references because the motivation to combine must flow from the prior art or other extrinsic evidence provided by the Examiner, and none has been provided nor pointed to. Accordingly, the present claims are not rendered Obvious by any of these three separate Rejections.

Braca again is a different catalyst system. The O is bound to Ni. And the ligand systems are different. The combinations of Drent, Brookhart II or Johnson with Braca would not be made by the skilled person, due to the fact that the skilled person would not be motivated to combine the different catalyst of Braca with any of the primary references because the motivation must flow from the prior art or other extrinsic evidence provided by the Examiner, and none has been provided nor pointed to. Accordingly, the present claims are not rendered Obvious by any of these three separate Rejections.

Masters is directed to oligomerization or isomerization, the ligand systems are different than the claimed systems, and there is therefore no motivation to combine any of the primary references with Masters, to arrive at the present claim elements.

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Accordingly, the present claims are not rendered Obvious by any of these three separate Rejections.

Withdrawal of all nine Rejections is respectfully requested.

12. *Claims 1, 6, 13, and 17-20 stand rejected under 35 U.S.C. § 103(a) as obvious over Drent, Brookhart II, Johnson, Master, Klabunde and Braca as applied to claims 1, 6, and 13 in 11. above, and in further view of Brookhart I.*

The Examiner's rationale for these 9 combinations is "... with the expected benefit of the catalyst being more cheaply activated than with the conventional alumoxanes..." Applicants respond that the catalyst arts are notoriously unpredictable, and as such Applicants do not agree with this characterization and respectfully request evidence that will support the Examiner's theory. Absent such evidence these nine Rejections fail to reach the level required of an Obviousness Rejection, and withdrawal is respectfully requested.

13. -15. No response necessary.

All of the Examiner's rejections and objections have been addressed.
The claims are in condition for allowance.

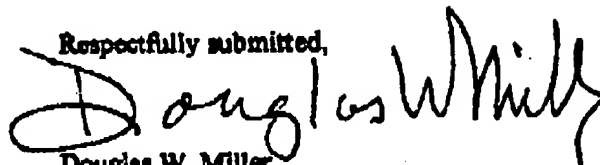
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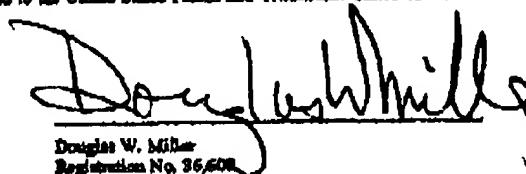


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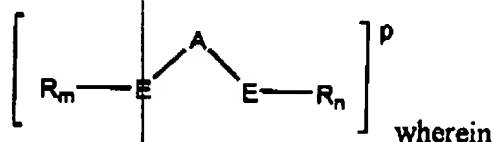
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APPENDIX A
CLAIMS MARKED-UP TO SHOW CHANGES MADE
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1. (Amended Five Times) A late transition metal catalyst system for olefin polymerization comprising: I.) a Group-9, -10 or -11 metal connected to a bidentate ligand, wherein a catalyst precursor has the formula:

LMX_r , wherein:

- (a) M is a Group 9, 10 or 11 metal;
- (b) L is a bidentate ligand defined by the formula:



- (i) A is a bridging group containing a Group 13-15 element;
- (ii) each E is independently a Group 15 or 16 element covalently bonded to M;
- (iii) each R is independently a C_1 - C_{30} radical or diradical group which is a hydrocarbyl, substituted hydrocarbyl, halocarbyl, substituted halocarbyl, hydrocarbyl-substituted organometalloid, or halocarbyl-substituted organometalloid[.];
- (iv) m and n are independently 1 or 2 depending on the valency of E; and
- (v) p is the charge on the bidentate ligand such that the overall [change] charge of LMX_r is neutral;
- (c) each X is, independently, a hydride radical, a hydrocarbyl radical, a substituted hydrocarbyl radical, a halocarbyl radical, a substituted halocarbyl radical, hydrocarbyl-substituted organometalloid or halocarbyl-substituted organometalloid; a univalent anionic ligand; a neutral hydrocarbyl-containing donor ligand; a neutral non-hydrocarbyl atom containing donor ligand; or two Xs are joined and bound to the metal atom to form a metallacycle ring containing from 2 to 20 carbon atoms; or two Xs are joined to form an anionic chelating ligand; and
- (d) r is 1, 2 or 3;

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II.) an activator compound; and

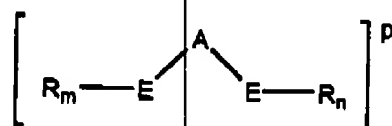
III.) a solid support wherein said late transition metal connected to said bidentate ligand is immobilized on said support, where the late transition metal loading is less than 100 micromoles transition metal per gram of solid support.

6. (Amended Five Times) A late transition metal catalyst system for olefin polymerization comprising: I.) a Group -9, -10 or -11 metal connected to a bidentate ligand, wherein a catalyst precursor has the formula:

LMX_p, wherein;

(a) M is a Group 9, 10 or 11 metal;

(b) L is a bidentate ligand defined by the formula:



wherein

- (i) A is a bridging group containing a Group 13-15 element;
 - (ii) each E is independently a Group 15 or 16 element covalently bonded to M;
 - (iii) each R is independently a C₁-C₃₀ radical or diradical group which is a hydrocarbyl, substituted hydrocarbyl, halocarbyl, substituted halocarbyl, hydrocarbyl-substituted organometalloid, or halocarbyl-substituted organometalloid[.];
 - (iv) m and n are independently 1 or 2 depending on the valency of E; and
 - (v) p is the charge on the bidentate ligand such that the charge of LMX_p is neutral;
- (c) each X is, independently, a hydride radical, a hydrocarbyl radical, a substituted hydrocarbyl radical, a halocarbyl radical, a substituted halocarbyl radical, hydrocarbyl-substituted organometalloid or halocarbyl-substituted

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organometalloid; a univalent anionic ligand; a neutral hydrocarbyl-containing donor ligand; a neutral non-hydrocarbyl atom containing donor ligand; or two Xs are joined and bound to the metal atom to form a metallacycle ring containing from about 2 to about 20 carbon atoms; or two Xs are joined to form an anionic chelating ligand; and

(d) r is 1, 2 or 3;

II.) an activator compound; and

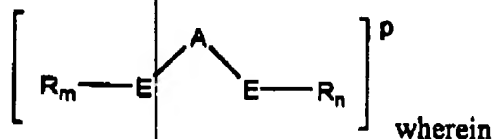
III.) a solid support wherein said late transition metal connected to said bidentate ligand is immobilized on said support.

13. (Amended Five Times) A late transition metal catalyst, essentially without residual solvent, for olefin polymerization comprising: I.) a Group -9, -10 or -11 metal connected to a bidentate ligand, wherein a catalyst precursor has the formula:

LMX, wherein:

(a) M is a Group 9, 10 or 11 metal;

(b) L is a bidentate ligand defined by the formula:



- (i) A is a bridging group containing a Group 13-15 element;
- (ii) each E is independently a Group 15 or 16 element covalently bonded to M;
- (iii) each R is independently a C₁-C₃₀ radical or diradical group which is a hydrocarbyl, substituted hydrocarbyl, halocarbyl, substituted halocarbyl, hydrocarbyl-substituted organometalloid, or halocarbyl-substituted organometalloid[.];
- (iv) m and n are independently 1 or 2 depending on the valency of E; and

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- (v) p is the charge on the bidentate ligand such that the oxidation state of MX_r is satisfied;
- (c) each X is, independently, a hydride radical, a hydrocarbyl radical, a substituted hydrocarbyl radical, a halocarbyl radical, a substituted halocarbyl radical, hydrocarbyl-substituted organometalloid or halocarbyl-substituted organometalloid; a neutral hydrocarbyl-containing donor ligand; a univalent anionic ligand; a neutral non-hydrocarbyl atom containing donor ligand; or two Xs are joined and bound to the metal atom to form a metallacycle ring containing from about 2 to about 20 carbon atoms; or two Xs are joined to form an anionic chelating ligand; and
- (d) r is 1, 2 or 3;

II.) an activator compound; and

III.) a solid support wherein said late transition metal connected to said bidentate ligand is immobilized on said support, where the late transition metal loading is less than 100 micromoles transition metal per gram of solid support.

17. (Amended four times) [A] The catalyst system [wherein the catalyst precursor] of Claims 1, 6, or 13 [has been treated with] wherein said activator is one of alkylalumoxane, modified alkylalumoxane, aluminum alkyl, aluminum alkyl halide, aluminum halide, ionizing anion precursor compounds or a noncoordinating anion precursor [to form a catalyst comprising a metal cation and a noncoordinating anion].

18. (Amended Once) The catalyst system of Claim 17 wherein the noncoordinating anion precursor comprises [is] tetrakis(perfluorophenyl)boron.

19. (Amended Four Times) The catalyst system of Claim 17 wherein the noncoordinating anion precursor comprises [is] a halide salt of Group-13-16 metals or metalloids.

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20. (Three Times Amended) The catalyst system of Claim [19] 18 wherein the catalyst-precursor-to-noncoordinating-anion-precursor molar ratio is from 10:1 to 1:10.

39. (Once Amended) The catalyst of Claim [38] 17 wherein the catalyst-precursor-to-alumoxane molar ratio is from 1:500 to 10:1.

Please add the following new claims:

41. (New) The catalyst system of Claim 17, wherein said alkylalumoxane comprises methylalumoxane, or wherein said modified alkylalumoxane comprises modified methylalumoxane.

42. (New) The catalyst system of claim 19, wherein a total transition metal compound to noncoordinating anion precursor mole ratio is from 10:1 to 1:10.